## CLAIMS

What is claimed is:

1. An external cavity laser comprising:

a laser light source;

means for collimating light output by said laser light source;

a diffraction grating receiving collimated light;

a cavity feedback mirror reflecting light received from said diffraction grating back to said diffraction grating, wherein at least a portion of said mirror is curved; and

means for tuning said external cavity laser to a set of wavelengths.

2. The external cavity laser of claim 1 wherein said laser light source comprises a Fabry-Perot diode laser.

3. The external cavity laser of claim 2 wherein said diode laser comprises no anti-reflection coating or an anti-reflection coating that does not suppress said diode laser's Fabry-Perot modes.

4. The external cavity laser of claim 3 wherein said tuning means comprises means for selecting a plurality of Fabry-Perot modes of said diode laser for the external cavity laser output.

5. The external cavity laser of claim 1 additionally comprising a tunable filter element to obtain absorption spectra for a plurality of wavelengths.

6. The external cavity laser of claim 5 wherein said tunable filter element is selected from the group consisting of monochromators and spectrometers.

7. The external cavity laser of claim 1 wherein at least a portion of said mirror is spherical.

8. The external cavity laser of claim 7 wherein a distance from said mirror to a point of diffraction of said diffraction grating is approximately a radius of curvature of said spherical portion of said mirror.

9. The external cavity laser of claim 8 wherein all wavelengths are retroreflected by said mirror.

10. The external cavity laser of claim 7 wherein a maximum bandwidth of said laser is approximately equal to an angular spread of said spherical portion of said mirror subtended by a spatial extent of said spherical portion of said mirror.

11. The external cavity laser of claim 1 wherein output of said laser is a zeroeth order output of said diffraction grating.

12. The external cavity laser of claim 1 wherein said curved portion of said mirror is curved in a plane of diffraction of said diffraction grating.

13. The external cavity laser of claim 1 wherein an external cavity length of said laser substantially determines maximum spectral resolution of said laser.

14. The external cavity laser of claim 13 wherein said length substantially determines a longitudinal mode spacing.

15. The external cavity laser of claim 14 wherein said length is less than a resolving power of a tunable filter employed with said laser.

16. The external cavity laser of claim 15 wherein said laser appears continuous to the tunable filter.

17. The external cavity laser of claim 1 wherein said diffraction grating is substantially at a focus of said curved portion of said mirror.

18. The external cavity laser of claim 17 wherein said diffraction grating and said curved portion of said mirror form a zero-dispersion stretcher assembly.

19. The external cavity laser of claim 17 wherein a gain of said laser corresponds to a round-trip time of a cavity of said laser.

20. The external cavity laser of claim 17 wherein a gain of said laser corresponds to a harmonic or sub-harmonic of a frequency determined by a round-trip time of a cavity of said laser.

21. A method of generating laser light via an external cavity laser, the method comprising:

emitting laser light from a source;

collimating light output by the source;

receiving collimated light with a diffraction grating;

reflecting light received from the diffraction grating back to the diffraction grating with a cavity feedback mirror, wherein at least a portion of the mirror is curved; and

tuning the external cavity laser to a set of wavelengths.

22. The method of claim 21 wherein the source comprises a Fabry-Perot diode laser.

23. The method of claim 22 wherein the diode laser comprises no anti-reflection coating or an anti-reflection coating that does not suppress the diode laser's Fabry-Perot modes.

24. The method of claim 23 wherein the tuning step comprises selecting a plurality of Fabry-Perot modes of the diode laser for the external cavity laser output.

25. The method of claim 21 additionally comprising the step of employing a tunable filter element to obtain absorption spectra for a plurality of wavelengths.

26. The method of claim 25 wherein the tunable filter element is selected from the group consisting of monochromators and spectrometers.

27. The method of claim 21 wherein at least a portion of the mirror is spherical.

28. The method of claim 27 wherein a distance from the mirror to a point of diffraction of the diffraction grating is approximately a radius of curvature of the spherical portion of the mirror.

29. The method of claim 28 wherein all wavelengths are retroreflected by the mirror.

30. The method of claim 27 wherein a maximum bandwidth of the laser is approximately equal to an angular spread of the spherical portion of the mirror subtended by a spatial extent of the spherical portion of the mirror.

31. The method of claim 21 wherein output of the laser is a zeroeth order output of the diffraction grating.

32. The method of claim 21 wherein the curved portion of the mirror is curved in a plane of diffraction of the diffraction grating.

33. The method of claim 21 wherein an external cavity length of the laser substantially determines maximum spectral resolution of the laser.

34. The method of claim 33 wherein the length substantially determines a longitudinal mode spacing.

35. The method of claim 34 wherein the length is less than a resolving power of a tunable filter employed with the laser.

36. The method of claim 35 wherein the laser appears continuous to the tunable filter.

37. The method of claim 21 wherein the diffraction grating is substantially at a focus of the curved portion of the mirror.

38. The method of claim 37 wherein the diffraction grating and the curved portion of the mirror form a zero-dispersion stretcher assembly.

39. The method of claim 37 wherein a gain of the laser corresponds to a round-trip time of a cavity of the laser.

40. The method of claim 37 wherein a gain of the laser corresponds to a harmonic or sub-harmonic of a frequency determined by a round-trip time of a cavity of the laser.